

Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application.

Listing of Claims:

1. (Currently Amended) A ~~An isolated~~ fusion protein comprising (i) a stress protein or an immunostimulatory a portion thereof and (ii) a variant of the hepatitis B virus (HBV) core antigen of SEQ ID NO:2, wherein, ~~within the HBV core antigen, the variant comprises the amino acid sequence of SEQ ID NO:2 in which~~ at least the isoleucine residue at position 97 but ~~one and~~ not more than 25 of the amino acid residues are substituted, and the fusion protein, when administered to an individual, induces or enhances an immune response against the HBV core antigen.

2. (Original) The fusion protein in claim 1, wherein the stress protein is a heat shock protein.

3. (Currently Amended) The fusion protein of claim 1, wherein the stress protein is selected from the group consisting of Hsp10, Hsp40, Hsp60, Hsp70, Hsp90, Hsp100-200, Hsp100, Lon, TF55, ~~Hsp40~~, FKBP, cyclophilin, Hsp20-30, ClpP, GrpE, ubiquitin, calnexin, ~~or a~~ protein disulfide isomerase, and a ~~or~~ small molecular weight stress protein family member of stress proteins.

4. (Previously Presented) The fusion protein of claim 1, wherein the stress protein is a mycobacterial stress protein.

5. (Previously Presented) The fusion protein of claim 4, wherein the mycobacterial stress protein is an *M. bovis* BCG stress protein.

6. (Previously Presented) The fusion protein of claim 5, wherein the *M. bovis* BCG stress protein is an *M. bovis* BCG hsp65 stress protein.

7. (Currently Amended) A fusion protein comprising the sequence of SEQ ID NO:6;  
SEQ ID NO:8; or SEQ ID NO:10; ~~or SEQ ID NO:12.~~

8. (Currently Amended) A pharmaceutical composition comprising the fusion protein of any one of claims 1 to 7 ~~or 21-33~~ and a pharmaceutically acceptable carrier or excipient.

9. (Canceled)

10. (Currently Amended) A ~~An isolated~~ nucleic acid comprising a sequence that encodes the fusion protein of any one of claims 1 to 7 ~~or 21-33~~.

11. (Currently Amended) A ~~An isolated~~ nucleic acid comprising the sequence of SEQ ID NO:5; SEQ ID NO:7; SEQ ID NO:9; or SEQ ID NO:11.

12. (Previously Presented) An expression vector comprising the nucleic acid of claim 10.

13. (Previously Presented) A retroviral vector comprising the nucleic acid of claim 10.

14. (Original) A cell comprising the expression vector of claim 12.

15. (Previously Presented) A method of making a fusion protein, the method comprising:

(a) providing the cell of claim 14, and

(b) culturing the cell under conditions that permit expression of the nucleic acid.

16. (Currently Amended) A method of inducing or enhancing an immune response against an HBV core antigen in a subject, the method comprising administering to the subject an effective amount of the fusion protein of any one of claims 1 to 7 ~~or 21-33~~.

17. (Original) A method of inducing or enhancing an immune response against an HBV core antigen in a subject, the method comprising administering to the subject an effective amount of the pharmaceutical composition of claim 8.

18. (Canceled)

19. (Original) A method of inducing or enhancing an immune response against an HBV core antigen, the method comprising administering to a subject an effective amount of the expression vector of claim 12.

20. (Currently Amended) A method of inducing or enhancing an immune response against an HBV core antigen, the method comprising administering to a subject an effective amount of the retroviral ~~expression~~ vector of claim 13.

21. (Currently Amended) The ~~isolated~~ fusion protein of claim 1, wherein, ~~within the HBV core antigen~~, 1-10 of the amino acid residues of SEQ ID NO:2 are substituted.

22. (Currently Amended) The ~~isolated~~ fusion protein of claim 21, wherein, ~~within the HBV core antigen~~, 1-5 of the amino acid residues of SEQ ID NO:2 are substituted.

23. (Currently Amended) The ~~isolated~~ fusion protein of claim 22, wherein, ~~within the HBV core antigen~~, 1-2 of the amino acid residues of SEQ ID NO:2 are substituted.

24-25. (Canceled)

26. (Currently Amended) The fusion protein of claim 1 ~~25~~, wherein the isoleucine residue at position 97 is substituted with a conservative ~~another~~ amino acid residue ~~that has a nonpolar side chain~~.

27. (Currently Amended) The fusion protein of claim 1 ~~26~~, wherein the isoleucine residue at position 97 is substituted with phenylalanine.

28. (Currently Amended) The fusion protein of claim 1 ~~24~~, wherein ~~the HBV core antigen comprises SEQ ID NO:2 and~~ the threonine residue at position 91 is substituted.

29. (Currently Amended) The fusion protein of claim 28, wherein the threonine residue at position 91 is substituted with a conservative ~~another~~ amino acid residue ~~that has a nonpolar side chain~~.

30. (Currently Amended) The fusion protein of claim 28 ~~29~~, wherein the threonine residue at position 91 is substituted with valine.

31. (Currently Amended) The fusion protein of claim 1 ~~24~~, wherein ~~the HBV core antigen comprises SEQ ID NO:2 and~~ the asparagine residue at position 87 is substituted.

32. (Currently Amended) The fusion protein of claim 31, wherein the asparagine residue at position 87 is substituted with a conservative ~~another~~ amino acid residue ~~that has a nonpolar side chain~~.

33. (Currently Amended) The fusion protein of claim 31 ~~32~~, wherein the asparagine residue at position 87 is substituted with valine.

34. (Previously Presented) An expression vector comprising the nucleic acid of claim 11.

35. (Previously Presented) A cell comprising the expression vector of claim 34.

36. (Previously Presented) A retroviral vector comprising the nucleic acid of claim 11.

37. (New) The fusion protein of claim 1, wherein the stress protein is a full length stress protein.

38. (New) The fusion protein in claim 37, wherein the stress protein is a heat shock protein.

39. (New) The fusion protein of claim 37, wherein the stress protein is selected from the group consisting of Hsp10, Hsp40, Hsp60, Hsp70, Hsp90, Hsp100-200, Hsp100, Lon, TF55, FKBP, cyclophilin, Hsp20-30, ClpP, GrpE, ubiquitin, calnexin, a protein disulfide isomerase, and a small molecular weight stress protein family member.

40. (New) The fusion protein of claim 37, wherein the stress protein is a mycobacterial stress protein.

41. (New) The fusion protein of claim 40, wherein the mycobacterial stress protein is an *M. bovis* BCG stress protein.

42. (New) The fusion protein of claim 41, wherein the *M. bovis* BCG stress protein is an *M. bovis* BCG hsp65 stress protein.

43. (New) A pharmaceutical composition comprising the fusion protein of claim 37 and a pharmaceutically acceptable carrier or excipient.

44. (New) The fusion protein of claim 37, wherein 1-10 of the amino acid residues are substituted.

45. (New) The fusion protein of claim 44, wherein 1-5 of the amino acid residues are substituted.

46. (New) The fusion protein of claim 45, wherein 1-2 of the amino acid residues are substituted.

47. (New) A fusion protein comprising the amino acid sequence of SEQ ID NO:12.

48. (New) The fusion protein of claim 47, wherein the fusion protein consists of the amino acid sequence of SEQ ID NO:12.

49. (New) A pharmaceutical composition comprising the fusion protein of claim 47 and a pharmaceutically acceptable carrier or excipient.

50. (New) A pharmaceutical composition comprising the fusion protein of claim 48 and a pharmaceutically acceptable carrier or excipient.

51. (New) A method of inducing or enhancing an immune response against an HBV core antigen in a subject, the method comprising administering to the subject an effective amount of the pharmaceutical composition of claim 49.

52. (New) A method of inducing or enhancing an immune response against an HBV core antigen in a subject, the method comprising administering to the subject an effective amount of the pharmaceutical composition of claim 50.

53. (New) A nucleic acid comprising a sequence that encodes the fusion protein of claim 47.

54. (New) A nucleic acid comprising a sequence that encodes the fusion protein of claim 48.

55. (New) An expression vector comprising the nucleic acid of claim 53.

56. (New) An expression vector comprising the nucleic acid of claim 54.

57. (New) A cell comprising the expression vector of claim 55.

58. (New) A cell comprising the expression vector of claim 56.

59. (New) A method of making a fusion protein, the method comprising:

- (a) providing the cell of claim 57, and
- (b) culturing the cell under conditions that permit expression of the nucleic acid.

60. (New) A method of making a fusion protein, the method comprising:

- (a) providing the cell of claim 58, and
- (b) culturing the cell under conditions that permit expression of the nucleic acid.

61. (New) A method of inducing or enhancing an immune response against an HBV core antigen, the method comprising administering to a subject an effective amount of the expression vector of claim 34.

62. (New) A method of inducing or enhancing an immune response against an HBV core antigen, the method comprising administering to a subject an effective amount of the retroviral vector of claim 36.

63. (New) A method of inducing or enhancing an immune response against an HBV core antigen, the method comprising administering to a subject an effective amount of the expression vector of claim 55.

64. (New) A method of inducing or enhancing an immune response against an HBV core antigen, the method comprising administering to a subject an effective amount of the expression vector of claim 56.

65. (New) A pharmaceutical composition comprising the fusion protein of any one of claims 21-23 or 26-33 and a pharmaceutically acceptable carrier or excipient.

66. (New) A nucleic acid comprising a sequence that encodes the fusion protein of any one of claims 21-23 or 26-33.

67. (New) An expression vector comprising the nucleic acid of claim 66.

68. (New) A retroviral vector comprising the nucleic acid of claim 66.

69. (New) A cell comprising the expression vector of claim 67.



70. (New) A method of making a fusion protein, the method comprising:

- (a) providing the cell of claim 69, and
- (b) culturing the cell under conditions that permit expression of the nucleic acid.

71. (New) A method of inducing or enhancing an immune response against an HBV core antigen in a subject, the method comprising administering to the subject an effective amount of the fusion protein of any one of claims 21-23 or 26-33.

72. (New) A method of inducing or enhancing an immune response against an HBV core antigen in a subject, the method comprising administering to the subject an effective amount of the pharmaceutical composition of claim 65.

73. (New) A method of inducing or enhancing an immune response against an HBV core antigen, the method comprising administering to a subject an effective amount of the expression vector of claim 67.

74. (New) A method of inducing or enhancing an immune response against an HBV core antigen, the method comprising administering to a subject an effective amount of the retroviral vector of claim 68.